

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

VOL. VIII. No. 17.]

APRIL 26, 1913.

[PRICE RS. 8.]

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer concludes in this issue his interesting report of his tour in the Travancore High Range. We cannot but endorse the Scientific Officer's recommendation that a Scientific Assistant should be appointed by the Kanan Devan Planters' Association, working under the instructions of the Scientific Department of the U. P. A. S. I. Every day brings home to us the value of scientific aid in our daily work, and the absolute necessity of it if we are to make our industries ever increasingly valuable and permanent. All over the world Scientific Colleges are being started to train young men for agricultural pursuits with marked success. We cannot but emphasize what the Scientific Officer says "a chemist with an all-round knowledge of agriculture would be a most valuable asset" and we yet hope to live to see every District Association with a Scientific Assistant of its own.

The Planting Expert after his recent visit to South Mysore contributes a most valuable article on Green Bug in Mysore. The key-note of which is to "Be Ready" and that there is no cause for panic if planters will only take the most elementary precautions to check the disease on its first appearance; but to do this they must "Be Ready" and we trust that every planter will read and digest this most-valuable paper.

An interesting article on Manurial Experiments with Tea is published. From the varying nature of soils and climate it is impossible to lay down any definite rule. This must be the result of experiment and locality, but it is justly laid down that soil analysis should be the basis of such experiments.

An estimate for developing a 1,500 acre estate under rubber in Ceylon is printed, and it would be interesting to compare it with the cost of same in Southern India.

An article about the School of Forestry at Cambridge University is reproduced, as showing the infinite value of training in every walk of life where scientific knowledge is necessary. The School of Forestry has more than justified its existence.

Scientific Officer's Papers.**CXVII.—REPORT ON A TOUR IN TRAVANCORE HIGH RANGE.
(Concluded.)****OTHER CROPS BESIDES TEA.**

Though Tea is the main crop grown in the district several other products are cultivated, and I had the pleasure of seeing something of these.

There appears to be a small area of Coffee still existing and this gives fair crops. I saw a little Ceara Rubber but was unable to visit the Hevea Rubber Estates. The Ceara has made good growth and is, I understand, tapping out well and yielding a sample of rubber which is fetching big prices. In all probability it would be a good policy to plant up a sufficient acreage of this product in the neighbourhood of Chattamanar and places with a similar soil and climate to employ a factory with machine driven rollers, &c.

An interesting experiment on a large scale was being tried with Camphor on one estate which I visited, and encouraging results were being obtained. With some slight alterations in the still the yield will probably be considerably increased. Use should be made of the dry fallen leaves, as these on distillation yield a high percentage of camphor. The trees were making a rapid growth, especially upon jungle soil, and will soon supply very large quantities of clippings. Probably the best way to cultivate camphor will be to grow it in big hedges kept clipped to a convenient height of 5 or 6 feet and not to allow it to form a tree. It is apt to be attacked by Pink Disease (*Corticium javanicum*), the same bark disease which attacks Hevea Rubber, and this was the case on this particular estate. The Bordeaux mixture treatment is not practicable in the case of this crop and so the diseased branches should be cut out and burned as soon as ever they make themselves apparent at the beginning of the dry weather, and an attempt made to remove them before spores are formed and distributed by the wind.

In some places large areas of Sisal are being put down but this has not yet reached a stage where it is big enough to cut. Fibre is being extracted from a somewhat older experiment plot in Coorg and it will be interesting in the future to compare the two if the respective owners will be good enough to supply figures.

With the gradual but constant demand for a supply of good commercial vegetable fibres, whether for textile, ropes, cordage or other purposes, there would seem to be a promising future for so valuable a fibre plant as the Sisal Hemp. This plant furnishes the commercial and well-known Sisal Hemp from its leaves, and has been in recent years somewhat extensively cultivated in South America, Hawaii, as well as in British, German and Portuguese, East Africa.

EXPERIMENTS.

A number of different experiments were discussed and arranged, while I was in the district dealing with the following points, Manuring of Tea, Green dressings, Growth of plants and use of prunings to prevent dry wash, freeing tea stems from moss. If these are carried out they should provide some very interesting information in future years. It was also arranged to experiment with some new varieties of Eucalyptus trees as fuel reserves. The Red Gum appears to grow very rapidly and well in the district, but it is by no means proved that this is the best possible fuel tree and it is well worth while experimenting with other varieties.

MISCELLANEOUS.

A considerable amount of damage is caused to Tea in some places by frost, especially in damp hollows. In this connection it is of interest to note that the vine growers in some part of the world protect their vine-yards from frost by means of the dense smoke produced by a large number of smudge fires which are kept ready round the vine-yards and lighted when frost is likely. It might be worth while experimenting in a similar way in some of the places which are annually damaged by frost.

At the Annual General Meeting of the District Planters' Association held on the 1st June, 1912 there was some discussion on the sale of Tea Fluff. I would call attention to the fact that this bye-product has proved to be a valuable form of manure especially for Roses, and that it is possible some special sale might be found for it to Horticulturalists and thus do away with the danger of its being used as an adulterant. An analysis of this material will be found in the *Chronicle* VIII, p. 51.

I was given specimens of an interesting curiosity found at Yellapatty known locally as 'the food of the gods.' This consists of very hard tuber-like masses of vegetable matter dug out of the soil which on being broken open present a grained surface somewhat resembling rice. The legend has it that these masses are rice which a god squeezes up in his hand (the shape of some of the masses supports this, fitting the fingers of a hand closed on it) and throws down from the tops of the hills. Should anyone eat this 'food' it produces a bad headache, but apparently conveys no particular benefits.

It struck me that these masses were probably of fungoid origin and so I sent some specimens to the Government Mycologist who writes of them that they are sclerotia of some fungus extraordinarily large and hard. It would be of great scientific interest to trace the connection between these sclerotia and the fungus producing them, which is probably to be found during the monsoon.

SCIENTIFIC ASSISTANT.

The district being large, but compact, is eminently suited for a Scientific Assistant of its own on the lines adopted by Coorg and Mysore and I earnestly recommend the District Association to seriously consider whether they cannot see their way to appoint one. A chemist with an all round knowledge of agriculture would be a most valuable asset. He could study the problems briefly discussed in this report on the spot, and if manuring has to be adopted in the near future would be invaluable in making soil analyses and recommending manures and checking their purity when they were purchased. Such a man could probably overcome the difficulties which at present arise in matters like Ratin, and there is the big subject of the manufacture of Tea left practically when Dr. Mann left it and crying aloud for further study. An Assistant of the right type would probably pay for his salary and his laboratory in a very short time.

CONCLUSION.

In conclusion I desire to express my gratitude to the Hony. Secretary and Chairman of the Kanan Devan Plaplers' Association for the generous aid they gave me in reaching the district and carrying out a tour in it, and also to Mr. H. L. Pinches and many others for the great kindness and hospitality they showed me throughout a most delightful and enjoyable tour among some of the finest scenery it has been my good fortune to see in South India.

RUDOLPH D. ANSTEAD,

Planting Expert.

THE SCIENTIFIC DEPARTMENT, U.P.A.S.I.
GREEN BUG IN MYSORE.

In recent issues of the *Chronicle* it has been mentioned that Green Bug (*Lecanium viride*) has made its appearance on the Coffee on certain estates in South Mysore in the Saklasapur district, and no doubt, those who have seen the results of the ravages of this pest in Ceylon, the Palneys, and Nilgiris will view this outbreak with the utmost alarm. In his account of the pest in Ceylon, Green says, "the insect being an inconspicuous one by reason of its colour and small size, it was not noticed till it had established itself in sufficient force to defy all efforts at extermination." In the Palneys and Nilgiris it is admitted that for many years nothing whatever was done to check the pest, and consequently it got such a hold that the Ceylon experience was practically repeated. In this present case, however, matters are very different. The sporadic outbreak has been discovered at once, and it was most wisely at once reported to the Scientific Department, and with their help it was at once dealt with. The consequence is that wherever it has appeared it is now well under control and at the time of my visit of inspection there was little to be seen but the places where it had been. In my opinion there is no need whatever for any kind of panic or even pessimistic alarm. The planters are fully alive to the danger of the pest, and they are keeping a sharp look out for it, the estates getting a constant tree to tree inspection and directly any signs of it is found it is reported and measures of control are at once adopted. Under such circumstances it is impossible for this pest to establish itself beyond control. The only danger is that it may be neglected on some particular estate either because it is not noticed, or from what the Chairman of the South Mysore Planters' Association so aptly terms 'cynical indifference.' This possibility is being guarded against as far as possible, and the Mysore Agricultural Department have kindly promised to co-operate with the Scientific Department of the U. P. A. S. I. in stamping out the pest should it appear on the estates of Indian planters. So far from the pest being unrecognised and neglected in this case, the district appears to be swarming with scientific men; the Mysore Scientific Assistant, the Coorg Scientific Assistant sent post haste to see what the pest looks like, and how to treat it, the Planting Expert inspecting the work done, and only a temporary illness prevented Dr. Coleman, the Director of Agriculture for the Mysore Government also turning up on the spot. In fact the South Mysore planters appear to be threatened with a sporadic outbreak of scientific men, which may possibly be worse to endure than green bug, but at any rate it should lead to a feeling of confidence and remove that needless spirit of panic of which there were some signs at first. So long as planters will keep a careful watch for the first appearance of the pest, and be ready to deal with it when it appears, there is no danger of the pest, becoming more than a nuisance, but on the other hand if it is neglected we have seen in Ceylon and elsewhere what it is capable of.

The plan of action adopted to deal with the outbreak is the following:—
As soon as it is found to be present on an estate, a tree to tree inspection is made and the infected area defined. As a rule one particular area will be found comparatively badly infected, that is almost every tree in it may have scale, and outside this only one tree here and there will be found with scale. It has probably been carried by birds to these isolated trees which should be dealt with drastically. The first thing to do is to prune the trees in the infected area so that they can be sprayed effectively. As much of the bug is cut off as possible, cutting the trees right back if necessary, and even in really bad cases removing all the leaves and young wood. The bug infected

Material removed from the trees is put into sacks on the spot and carried out into the nearest convenient open space and *burned*. Coolies doing this work should not be allowed to pass through uninfected coffee or they will spread the scales, which cling to their clothes. In fact no one should be allowed to go straight from the infected area to clean coffee on the same estate or any other estate. Having cut off as much bug as possible, the stems and primaries of the trees are scraped and cleaned with a little lime water and then the area is thoroughly sprayed. The best mixture to use is one pound of Rosin, one pound of Washing Soda, and one pound of Soap. The Rosin is powdered as finely as possible and mixed with the Soda and a little water and the mixture boiled slowly. As it boils up a little more water is added from time to time and it is kept well stirred till it is all dissolved to a clear liquid. The soap, which has been shaved, is next added in small doses at a time and the mixture boiled with constant stirring till all is dissolved. It is then cooled and the volume made up to four gallons and this used as a spray applied through a mist nozzle from some form of sprayer.

At the same time as the coffee is pruned and sprayed as many ants as possible must be destroyed and the nests of the Red Ant and the little Black Ant which runs about with its abdomen curled up over its back found and burned. These ants carry the scales about and distribute them and tend them as man tends cattle. During the monsoon the ants protect the scales and if the nest of the Red Ant is examined during the monsoon it will be found full of young scales. As soon as the monsoon is over the ants bring these out and place them on the Coffee trees.

The process of pruning &c., will have knocked off a large number of young scales on to the ground and mulch, and these will be able to regain a position on the trees; so as soon as spraying is finished the roads should be swept clean and all the mulch buried cleanly to a depth of about three inches with a good dressing of Lime. At the same time the boundaries should be carefully examined for the presence of scale on shrubs and weeds and kept cut back and clean.

About a week after spraying another careful inspection of the infected area should be made and if any fresh scale is found the trees should be sprayed again. The object is to kill all the scales in a young stage before they can produce eggs and young, and thus eradicate the pest.

The scale flourishes best in fine weather interspersed with light showers, and it is usually at its height from the middle of March to the middle or end of May when the monsoon checks it, *but the monsoon only checks it and does not kill it or eliminate it entirely*. The heavier the monsoon the more the scale will be checked, especially if its parasitic fungus is present, but it will not entirely remove it. It begins again about September and goes on spreading rapidly till January when the drought may check it again to a certain extent until March. Therefore, at the end of the monsoon, when the fine weather comes another inspection must be made, and if any trace of scale is found another spraying must be done. An after monsoon mannr- ing also to put vigour into the trees is a good plan.

These are the means which are being adopted in the infected area and if they are whole-heartedly carried out there is no reason why the scale should not be kept in bounds and under control, if not eradicated. Its eradication largely depends upon its method of introduction, and on this point it is difficult to come to a definite conclusion and nothing is as yet proved. A rumour is afloat that it has been introduced on manure bags. This, however, cannot be proved and it seems to me unlikely. I should

expect the majority of manures to act as insecticides, and I cannot imagine a scale living for any length of time on a manure bag. It is possible but not probable. Messrs. Stanes & Co., hearing of the rumour which they consider calculated to do harm to their business have written assuring me, "that not a single bag in which manure has been supplied is a crop bag. All the bags in which we pack manure are procured from Madras or Calicut and are bags that have been used once for packing common salt in. The manure works are situated a mile from the coffee curing works and they have no connection with each other." I have much pleasure in giving publicity to this statement and until proof is produced that manure has been sent to estates in crop bags, and that this is a possible means of importing green bug, credence cannot be given to the theory.

One way in which it can be introduced is on plants from Bangalore and other places. About a year ago, it was actually introduced on a coffee estate in this way but luckily it was discovered in time and destroyed. In a recent report on a tour in Mysore the Government Entomologist said, "when touring by rail I often see at railway stations consignments of plants and young trees (mangoes, &c.) being sent by rail and it is very rarely indeed that I am unable to detect some scale insects or other pests being carried with them." In this particular instance I was unable to trace the infection to this source, but I think it quite probable that at most places along the railway line such as Arsikere, Kadur, &c., a search would reveal the presence of Green Bug on the trees. From these centres it spreads, carried naturally by wind, birds, &c., and in bandies on branches &c. In all probability it will be found upon investigation that it has reached the neighbourhood of this particular group of estates on the jungle and that the infection is coming in from that jungle. On this point the Scientific Department of the U. P. A. S. I. will welcome the assistance of all planters, and of the Agricultural Department of the Mysore Government. If the nearest point of infection can be found, some steps can be taken to clean up the jungle, or isolate the estates from future danger of infection. In the meanwhile all estates owners, both European and Indian, should keep a most careful watch for the appearance of the scale on their land and should they find it, report it at once and take immediate steps to deal with it.

This leads to another most important point, *the necessity of being ready*, to deal with the pest immediately it appears. Despite frequent warnings in the *Chronicle* and elsewhere given by the Scientific Department from time to time this present outbreak found the planting community entirely unprepared. No one had sprayers or insecticides ready, and a lot of valuable time was wasted before the former could be procured in quantity. Indian firms do not stock these things and only three sprayers were available nearer than Calcutta. Once more I would impress upon individual planters the necessity of possessing at least a sprayer or two. As long ago as January 1911 the following note appeared in the *Chronicle* (VI. p. 47): it fits the present situation so exactly that further comment is unnecessary.

"Be ready!—A short time ago I was looking through some old files and came across a lecture to Ceylon planters by the Government Entomologist. The cap fits some South Indian planters so exactly that I cannot resist reproducing the following extract:—

"I wish particularly to draw your attention to the importance of being prepared for any emergency, such as the sudden appearance of a dangerous pest. How many of you possess even a single spraying machine or a powder-distributor, or any stock of even the simplest insecticide? If there is a

sprayer, it is probably poked away in some out-of-the-way corner and never looked at. If suddenly required, it is found that the valves have gone wrong, or the rubber tubing has perished, and it has to be sent to Colombo for repair just when it is most urgently needed! The machine when not in constant use, should have clean water pumped through it at least once a fortnight, and after use with any insecticide, it should be carefully washed out with (preferably warm) water before being put away. The machine might be kept in order by using it for watering the ferns or flower beds when not required for more serious work. Every single estate should possess at least one good sprayer and a powder-distributor. Then at times of any serious local outbreak co-operative measures could be quickly undertaken.

* Then a supply of some of the simpler insecticides should be kept on every estate, ready for an emergency, just as medicines are kept for cases of sudden sickness amongst your coolies. Every estate has its supply of such simple drugs as chlorodyne, santonine, quinine &c. Why should you not be equally prepared with kerosine emulsion, sulphur, Bordeaux mixture, and arsenical preparations, against diseases of your plants? What is usually the course when an insect pest shows itself? To begin with, it has probably been on the place for some time before it has been observed; another three or four days go by while specimens are being forwarded to the Government Entomologist and his reply and recommendations received. Then, if any special treatment is required, it is as likely as not that an order has to be despatched to Colombo for the necessary material, resulting in a loss of another week before action is taken when every day at the commencement of an attack is of the utmost importance. In dealing with insect pests, the proverbial "stitch in time" will save not only 9 but 999, and make indeed the difference between success and failure. The early observation of any pest is a point that should be attended to. Encourage your coolies and kangaries to report (and bring specimens of) any insect found upon the trees. Presume that every such insect is an enemy until you have assured yourselves that it is harmless."

RUDOLPH L. D. ANSTEAD,

Planting Expert.

UNITED STATES OF AMERICA (HAWAII).

RUBBER PRODUCTION.

Rubber is steadily becoming a more important item of Hawaii's products. On the Island of Maui many trees have been planted, and these are now being tapped in large numbers. Steady efforts are being made to improve the methods of preparation in order to increase the marketable value. 35,000 trees were tapped during 1912, and altogether some 8,000 lbs. of rubber were expected to be produced, most of which will be exported. For 1913 an output of 20,000 lbs. is anticipated.

Attention has been directed to an indigenous rubber tree (*Euphorbia hirtifolia*), which grows in several localities, one place in particular on the Island of Hawaii having 6,000 acres averaging 75 trees to the acre, whose product is 14 to 17 per cent. of rubber and 60 per cent. of resin (chicle). It is reported that the latex contains 42 per cent. of solid material, and that one man can collect 16 to 30 lbs. of crude product per day.—*The Board of Trade Journal*.

TEA.

Manurial Experiments with Tea.

The results of manurial experiments with Tea carried out at Heeleaka were published some time ago, and in the *Quarterly Journal of the Indian Tea Association Scientific Department* IV, 1912 Dr. Hope discusses some results recently obtained in Assam.

In Southern India some estates have applied manure to their Tea and during the next ten years a great many more will find it necessary to do so. The best manures, and combination of manures, must be discovered by systematic experiments and though the fertilisers found most suitable for Ceylon and Assam soils may not prove equally suitable for the soils of Southern India, still it is of interest to note what results have been obtained in these places as likely to indicate at any rate the broad lines upon which experiments are likely to be successful.

Lime.—The authors of the paper mentioned above say:—“Attention has recently been drawn to the probability of lime proving a more valuable manure for tea than was at one time supposed.” This idea has received support from the results of experiments made with it. “It should be remembered that lime like other manures will only have a beneficial effect when applied to soils for which it is suited and in correct quantities. In considering the manurial value of lime it must first be borne in mind that the tea plant does not require a soil rich in lime. This is obvious from the fact that practically every tea soil in the North East Indian tea districts is poor in lime, those of the Assam Valley being particularly so, the average amount for the Sibsagar district being approximately 0.04% and for the rest of Assam but little higher.” This is also a typical feature of the tea soils of Southern India. “The benefit of lime on tea is due to its action in remedying some defect in the state of the surface soil. Such defect is probably due to the condition of activity of the soil bacteria, as the result of the absence of sufficient carbonate of lime to correct sourness of the soil. The cause of this insufficiency of carbonate of lime is to be found in the effect of heavy rainfall on cultivated soil which is fully exposed to the weather.”

Several experiments with lime are quoted, on heavy clay soils, on black soil in which tea grows poorly with a shallow root system, and on low lying soil. In all cases a decided benefit was obtained both when lime was applied alone and when it was mixed with other manures, the most striking result being obtained on the first class of soil where in one instance a plot which received seven maunds of lime per acre gave 15.99 maunds of tea per acre while the check plot which received no lime only gave 9.47 maunds of tea per acre.

Nitrolim.—To quote the report, “at the present time comparatively few figures are to hand to show what the value of nitrolim as a tea manure is for different soils, but many experiments with this manure are likely to be made in the future in view of the fact that this is the cheapest nitrogenous manure on the market if the value of different nitrogenous manures be gauged by comparing their relative prices per unit quantity of nitrogen. If it can be shown that this manure gives as good or better results than other nitrogenous manures when applied in quantities which will provide the same amount of nitrogen it would obviously be the most economical manure to use.”

Experiments do not, however, prove this altogether and better results appear to be obtained from the application of oil cakes, but probably the best results have not yet been recorded with nitrolim. “One decided

advantage which nitrolim has over other nitrogenous manures is that it is alkaline in character since it contains an excess of lime."

Organic Matter.—The importance of replenishing the organic matter which has been lost to the soil by repeated cultivation and constant exposure is emphasized. The best way of supplying organic matter to tea soils is through the medium of green dressings. "In cases where cattle manure has been found to give good results the addition of a considerable quantity of organic matter rather than of nitrogen, potash, and phosphoric acid, may be looked upon as the cause of the improvement.

Potash.—The authors state :—"It is probable that the value of potash manures for North East Indian tea soils may lie in their effect upon the quality of the leaf. This seems to be indicated by the figures obtained, though a matter of this kind cannot be decided by a single experiment. Further investigation should be made in different districts under conditions which would permit of inferences being drawn as regards the effect on quality. Except in special instances the results of potash manuring in increasing yield of leaf have been poor, particularly in Assam."

Nitrogen.—A number of experiments with different nitrogenous manures by themselves and in combination with wood ashes and other materials are discussed. One point that is brought out is the value of phosphoric acid when present in these combinations, both as sterilized animal meal and basic slag. Mustard cake gave favourable results at Heeleaka and some Assam experiments are described which show that the right quantity to use is a smaller application than five maunds per acre.

"Other experiments have shown that a soil after receiving repeated dressings of oil cake failed to produce an increase of crop and in some cases the crop even decreased. An application of lime to such soils has restored the fertility."

The article under review closes with an account of some systematic experiments made on a red sandy loam deficient in nitrogen (0.02%). The most successful plot was the one receiving most nitrogen and the order of merit of the plots was in direct ratio to the amount of nitrogen supplied. The authors sum up these results as follows :—"In the year following the application of the manures the increase was maintained best on those plots which received the greatest amount of insoluble nitrogenous manure, in this case oil cake. It will also be noted that in this particular instance the oil cake was almost as quick acting as the soluble manures. A plant when growing will assimilate a certain definite quantity of food material, which is governed by the nature and growth of the plant. Any deficiency in one constituent will react to produce less assimilation of any other constituent. On the other hand, if the food materials are in excess the plant will assimilate as much as it requires, the rest will remain as an excess in the soil, and this, if of a soluble nature, will be carried away to a greater or lesser extent according to the mechanical nature of the soil, and the movements of soil water. In the case under consideration it appears that a considerable amount of the soluble nitrogenous compounds have been removed by wash. The result has been that the plants have been able to utilise the nitrogen slowly rendered available from the insoluble compounds more completely than from the more soluble nitrogenous manures."

Similar manurial experiments with tea are badly needed in Southern India based upon soil analyses. The present system of hit or miss is scarcely likely to lead to the best results.

R. D. A.

RUBBER.

The Necessity of Using Machinery on Rubber Estates.

BUY AT ONCE. DO NOT WAIT; BECAUSE A BETTER MACHINE May BE INTRODUCED LATER.

"Every effort must be made by planters to ship their rubber as uniform as possible in quality, and to maintain an even grading." Thus write Messrs. Gow, Wilson in their Annual Report. In this way it will be possible to deal with a much larger proportion of the crops by private treaty for near and future delivery, thus keeping the auctions within reasonable bounds. Visiting agents and managers generally would be well advised to bear in mind the great importance of this standardizing and grading on all estates.

"The large amount of supervision (preferably European) required in the factory to maintain efficiency does not appear to have been sufficiently appreciated in the past, and many estates have been rather *too much inclined to await the development of some possible new process before installing adequate machinery*, which would most probably be required in the future, whatever new methods might come into use.

"The preparation of rubber generally has continued to make satisfactory progress, and it has been proved that the physical properties of the best prepared samples are fully equal to any other kind of rubber.

"Crêpe and smoked sheet still form the two principal and best descriptions manufactured. In the earlier part of the year the former was in most request, and on the average realised the best prices, but partly owing to the comparative shortage of first quality smoked sheet, this kind has since come into very strong demand, realizing a premium over all other sorts.

"A very large proportion of the whole crop is shipped in the form of crêpe, but as the premium lately ruling on smoked sheet will inevitably cause a large increase in its production it seems unlikely that that premium will be maintained.

"The smoking process has many points to recommend it, especially as regards the strength and durability of rubber so treated. Up to the present this particular preparation has been a more cumbersome one and has taken a considerably longer time than that of crêpe. Also unless the smoking and drying have been very carefully and thoroughly carried out, the rubber is sometimes liable to arrive in a moist and mouldy condition."—*Tropical Life*.

RUBBER ESTATE DEVELOPMENT AND ITS COST.

We are indebted to Mr. Herbert Inglis, the well-known Kalutara planter, for the following estimate (in reference to the question raised in our columns lately) of what he considers would be cost of developing a rubber estate of 1,500 acres for two years before it comes into bearing. A motor-car would not be necessary. The cost is set out as follows:—

	Rs.		Rs.
Superintendent's Salary at	800 a month	...	19,200
Assistant's Salary at	250 "	...	6,200
Director's Fees	4,000 a year	...	8,300
Office Expenses	3,000 "	...	6,300
V. A.	1,000 "	...	2,300
Medical Fees	3,000 "	...	6,300
Sundries, Clerk, etc.	1,250 "	...	2,500
Bungalow and Lines	—	...	20,000
Furniture	—	...	2,500
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—Ceylon Times.

Total Rs... 72,200

SELECTED CUTTINGS.

School of Forestry at Cambridge University.

The best and most lasting tribute to Mr. Henry's work in connection with the School of Forestry at Cambridge lies in the fact that, although it was only established seven years ago, it is already a flourishing institution and of acknowledged efficiency. As the following brief account of the curriculum illustrates, this success is due primarily to the prominent place which practical forestry takes in the course of studies:—

Instruction in Forestry was instituted in the University of Cambridge in 1907, when a Forestry Committee of the Board of Agricultural Studies was formed, and Mr. Augustine Henry was appointed Reader in Forestry.

The course of study for the Diploma in Forestry may be summarised as follows:—Candidates for admission to the examination for the diploma must have (1) obtained the degree of B.A., (2) passed qualifying examinations in Botany, Geology, Physics, and Chemistry; and (3) attended for two years courses of instruction in Forestry and cognate subjects.

The course for the first year includes lectures and practical work in Forest Botany, Silviculture and General Forestry. During the long vacation the student spends ten weeks on a British woodland estate in practical work under the superintendence of an experienced forester.

The course for the second year includes similar instruction in forest management and forest utilisation, and in diseases of Trees and Timber, Timber, Forest Zoology, Surveying and Engineering. During the long vacation of this year the student has ten week's practical work in a Continental forest under the superintendence of a State forester.

The total fees for instruction in Forestry for the diploma course at the University amount to £9-19s.-6d. The fee for admission to the examination for the diploma is £2-2s. The student in addition incurs the expenses, which are variable, of instruction during the two long vacations in British and Continental forests.

An elementary course in forestry has been established for agricultural students, who are now encouraged to take forestry as an optional subject in the examination for the diploma in Agriculture and for the B.A. degree in Agricultural Science. This elementary course is identical with the first year's course for the diploma in Forestry.

The woods used for the purpose of demonstration are all privately owned, and lie in the neighbourhood of Cambridge and in the adjoining countries. Visits are made to private woods and plantations, including the Botanic Gardens at Cambridge, weekly during term time, and afford an opportunity of seeing every type of woodland in the Eastern Counties of England, and of study of many forestry operations.

There is no land at present under the control of the Forestry Department, but certain experiments have been carried out by the Reader and by the Lecturer on Timber, with the assistance of private owners interested in Forestry.

A large collection of specimens, about 1,900 in number illustrative of Timbers, Forest Botany (exclusive of Herbarium specimens) and diseases of Trees, has been made. The timbers include not only home-grown species, but also examples of most of the important trees of India, China, Japan, and North America. The timber collection is unrivalled for its variety and illustrates many problems of Silviculture.

A forestry building, which will comprise laboratories, workshop, lecture rooms, and museum, will be erected during the present year at a cost of about £5,000. Funds for building and equipment amounting to over £4,500 have been provided by private benefactors. In addition, the Development Commissioners have sanctioned a grant of £2,500 towards the building, so that the Forestry Committee has now at its disposal about £7,000 for building, equipment and maintenance.

The Board of Agriculture and Fisheries having provided from the Development Fund £500 a year for two years for Research Work on Timber, the Forestry Committee have appointed Mr. E. R. Burdon, M.A., Investigator in Timber for two years from January 1, 1913, and Mr. A. P. Loug, B.A., Assistant Investigator for the same period.

The Development Commissioners have also sanctioned a grant of £500 a year for three years for Advisory Work in twelve counties in the East of England, comprising Middlesex, Hertfordshire, Essex, Northamptonshire, Bedfordshire, Huntingdonshire, Northamptonshire, Rutlandshire, Cambridgeshire, Suffolk, Norfolk, and Lincolnshire. An Adviser in Forestry, Mr. C. Hawkins, has been appointed by the Forestry Committee for a period of three years, from April 1, next.

The training of Probationers for the Indian Forest Service began at Cambridge in October, 1911. The Forestry Committee, in consultation with the Director of Indian Forest Studies, issued in January, 1912, special regulations for the additional course of study for Indian Forest Probationers, which is required by the Secretary of State for India in Council. In connection with the training of the Indian Forest Probationers, Mr. H. Jackson, Conservator of Forests, India, gives courses of lectures in Indian Forestry and Forest Law.

The Forestry Department is supported in part by annual subscriptions from the County Councils of Northamptonshire, Norfolk, Cambridgeshire, West Suffolk, and Huntingdonshire by a Government Grant from the Board of Agriculture and Fisheries; and during the past year ten of the Cambridge Colleges, Clare, Pembroke, Gonville and Caius, Trinity Hall, King's, Queen's, Christ's, St. John's Trinity, and Emmanuel, have also contributed. —*The Gardeners' Chronicle*.

SOUTH AFRICA.

Registration of Fertilisers.—With reference to the notice on pp. 402-3 of the "Board of Trade Journal" of 23rd November, 1911, and to previous notices relative to the importation and registration of fertilisers in the Cape Province, H. M. Trade Commissioner for South Africa (Sir R. Southern Holland) has forwarded a copy of an official notice which has been issued to importers in South Africa calling their attention to certain points regarding the registration of fertilisers. Importers are reminded that the practice of re-registering any particular consignment that may vary slightly in chemical composition from that originally registered for that particular brand is liable to lead to confusion, and that in future the authorities will not accept concurrent registrations of this nature. If the difference in composition is so great that the original registration will not serve, the new article to be registered must have some distinguishing title, such as, "Quality A" added to its name. If this is not done the original registration will be regarded as cancelled, and all fertilisers sold under, or bearing, the brand concerned will be regarded as governed by the last registration, and the importer will be held responsible accordingly. —*The Board of Trade Journal*.